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# Ionic liquid based ion-pairing microextraction combined with spectrophotometry for preconcentration and quantitation of melamine in milk and milk-based products

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## Abstract

A simple, rapid and economical ultrasound-assisted microextraction (UA-ME) procedure was developed for extraction and determination of trace amounts of melamine in milk products, followed at 310 nm by UV-Visible spectrophotometry. In the study, 1-hexyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide [$C_6$mim][$Tf_2$N] as ionic liquid (IL) was used in presence of sodium dodecyl sulfate (SDS) as an oppositely charged auxiliary ligand at pH 4.0 for extraction of melamine, and methanol was selected as a disperser solvent. Under the optimal conditions, the analytical features of method were established by calibration curves prepared from both solvent based calibration and matrix-matched calibration solutions. The method exhibits a linear relationship (from 5 to 250 μg $L^{-1}$), low detection limit (1.6 μg $L^{-1}$), good recovery (93.5-97.8%), and high sensitivity enhancement factor (125) by solvent based calibration curve while it allows a detection limit of 2.1 μg $L^{-1}$ in range of 5-210 μg $L^{-1}$ by the matrix-matched calibration curve. The method accuracy (trueness and precision) was checked by applying matrix-matched calibration strategy to all the spiked samples including quality control samples as well as comparison with an independent micellar LC method, and then it was successfully applied to the determination of melamine in milk based products.